



ENVIRONMENTAL PRODUCT DECLARATION



In accordance with ISO 14025:2006 and EN 15804:2012+A2:2019/AC:2021 for:

PRODUCT LINE:

NANOTTICA

PRODUCT NAME:

NANOTTICA 1.5ft ES PC 8000/840

COMPANY NAME:

TREVOS



Programme:

The International EPD® System, www.environdec.com

Programme operator:

EPD International AB

EPD registration number:

S-P-03446

Publication date:

2023-06-20

Valid until:

2028-06-19

An EPD should provide current information and may be updated if conditions change.

The stated validity is therefore subject to the continued registration and publication at www.environdec.com



Company information

Owner of the EPD: TREVOS, a.s.

Contact: certification@trevos.cz

Description of the organisation:

Established over 30 years ago, and still fully Czech-owned, TREVOS is a market-leading producer of light fixtures. Our wide range includes industrial and indoor LED luminaires boasting exceptional energy efficiency. Building on its own research and development efforts and protected know-how, TREVOS is a major exporter, supplying its top-quality products and illuminating the lives of customers in over 60 countries worldwide.

Product-related or management system-related certifications: ISO 9001:2016, ISO 14001:2016
ISO 45001:2018, ISO 50001:2019

Name and location of production site: TREVOS, a.s., Nová Ves 34, 511 01 Turnov, Czech Republic

Product information

Product name: NANOTTICA

Product description:

IP66/IP69-rated, NANOTTICA is a state-of-the-art industrial luminaire that utilizes a unique patent-protected nano-optical structure, ensuring a very low UGR. Boasting an impact protection rating of IK10, the fitting is supplied in three different beam angles — customers can choose between medium beam, wide beam and narrow beam. In addition to an electronic driver, the luminaire features LED sources that retain 90% of their initial output at 50,000 hours. A size 1.5ft fitting has dimensions of 1,455x98x84 mm and a weight of 2.0 kg.



Product identification: NANOTTICA

UN CPC code: 4653 Lighting equipment

Geographical scope: Global

LEGENDA:

NANOTTICA 1.5ft aa bb cc dddd/eee fff gg for example: NANOTTICA 1.5ft ES PC 8000/840

aa = energy series **ES** - lower energy consumption, **HE** - high efficiency and sulfur-resistant chips, **base version without denotation**

bb = type series **WB** – wide beam, **NB** – narrow beam, **TRS** - indirect lighting (clear base),
VP - outdoor (added ventilation sticker Gore), **TL** - translucent (translucent diffuser),
base version without denotation (MB)

cc = material – PC/PC, PCc/PC,

dddd = lumen flux 3250 up to 8000 lm

eee = CRI and CCT 827 to 865 and 927 to 965

fff = **base version without denotation** or **DALI** (version with digital dimmable driver DALI)

gg = **"1F"** = light fitting with 1-phase 3 core through-wiring, or


"3F" = light fitting with 3-phase 5 core through-wiring, or

" " = light fitting without through-wiring

General information

Programme information

Programme:	The International EPD® System
Address:	EPD International AB Box 210 60 SE-100 31 Stockholm Sweden
Website:	www.environdec.com
E-mail:	info@environdec.com

Accountabilities for PCR, LCA and independent, third-party verification
Product Category Rules (PCR)
CEN standard EN 15804 serves as the Core Product Category Rules (PCR)
Product Category Rules (PCR): PCR 2019:14 CONSTRUCTION PRODUCTS, version 1.2.5
PCR review was conducted by: The Technical Committee of the International EPD® System. Chair of the PCR review is Claudia A. Peña. The review panel may be contacted via info@environdec.com
Life Cycle Assessment (LCA)
<p>LCA accountability: LCA Studio s.r.o. prof. Ing. Vladimír Kočí, Ph.D., MBA, Ing. et Ing. Tatiana Trecáková, PhD., Bc. Petra Kšenzíghová Šárecká 1962/5, 16000 Prague 6, Czech Republic, www.lcastudio.cz</p> 
Third-party verification
<p>Independent third-party verification of the declaration and data, according to ISO 14025:2006, via:</p> <p><input checked="" type="checkbox"/> EPD verification by individual verifier</p> <p>Third-party verifier: prof. Ing. Silvia Vilčeková, Ph.D., Silcert, s.r.o.</p> <p>Approved by: The International EPD® System</p> <p>Procedure for follow-up of data during EPD validity involves third party verifier:</p> <p><input type="checkbox"/> Yes <input checked="" type="checkbox"/> No</p>

The EPD owner has the sole ownership, liability, and responsibility for the EPD.

EPDs within the same product category but registered in different EPD programmes, or not compliant with EN 15804, may not be comparable. For two EPDs to be comparable, they must be based on the same PCR (including the same version number) or be based on fully-aligned PCRs or versions of PCRs; cover products with identical functions, technical performances and use (e.g. identical declared/functional units); have equivalent system boundaries and descriptions of data; apply equivalent data quality requirements, methods of data collection, and allocation methods; apply identical cut-off rules and impact assessment methods (including the same version of characterisation factors); have equivalent content declarations; and be valid at the time of comparison. For further information about comparability, see EN 15804 and ISO 14025.

LCA information

Functional unit / declared unit: Declared unit is 1000 lumens of the industrial LED luminaire.

Reference service life: 80 000 hours

Time representativeness: Site specific data from producer are based on 1 year average for process data (reference year 2022). Time scope less than 10-years was applied for background data. Time scope less than 2-years was applied for specific data.

Database(s) and LCA software used: software LCA for Experts. Sphera databases, ecoinvent 3.8 database.

Description of system boundaries:

The system boundary is Cradle to grave and module D (A+B+C+D) according to EN 15804 + A2/AC:2021. It covers the production of raw materials, all relevant transport down to the factory gate, manufacturing by Trevos, a.s., transport from the Trevos, a.s. plant to the site (considered weighted average 769 km), installation of luminaire, operational energy of use of luminaire (considered European residual electricity grid mix), deconstruction of the luminaire, transport of deconstructed materials, waste processing, recovery, and disposal of used luminaire.

System diagram:

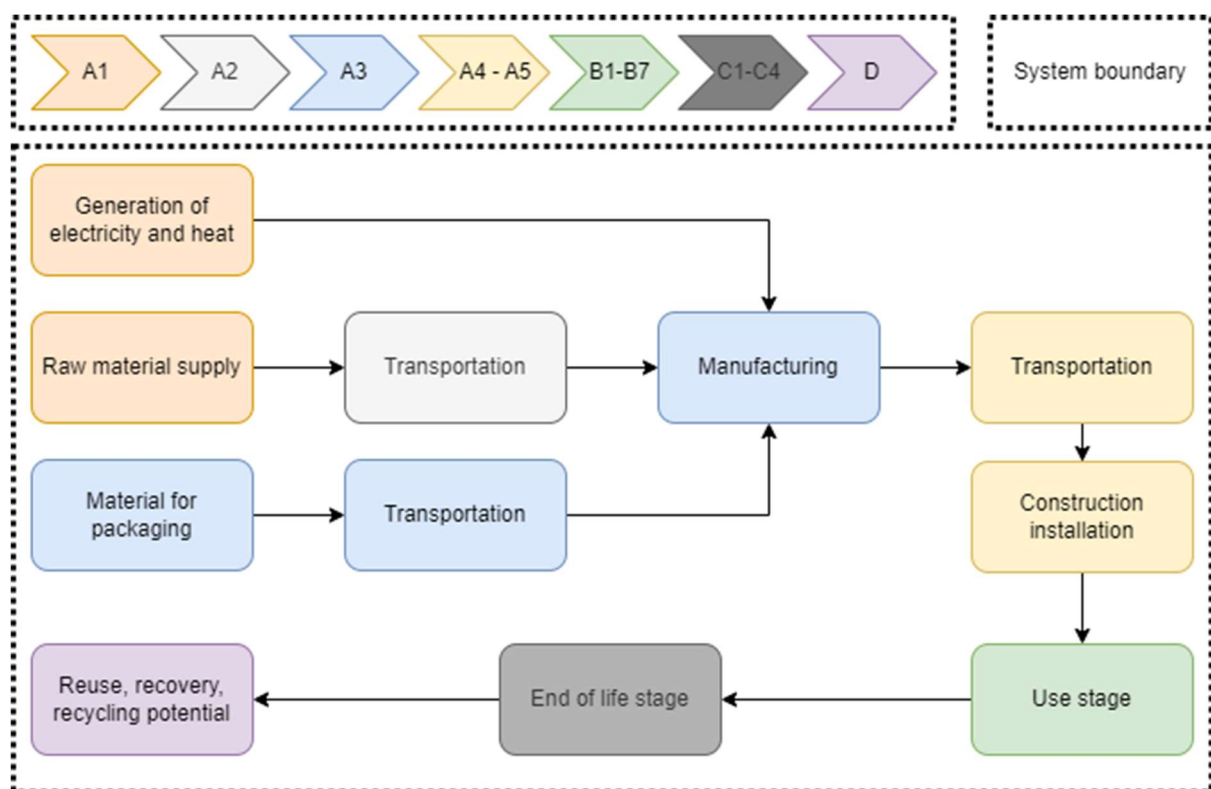


Figure 1 System boundary of the LCA study conducted on NANOTTICA 1.5ft ES PC 8000/840

More information:

Cut off rules: The cut-off criterion was chosen based on the used PCR. According to the used PCR, more than 95 % of flows were included.

Allocations: All material and energy flows were assigned to one product. Allocation was not necessary.

No secondary fuels or materials are used in production. Generic process data for the production of input materials and components were used.

Electricity consumption: Generation of electricity consumed within Trevos, a.s. production was based on the Czech residual electricity grid mix.

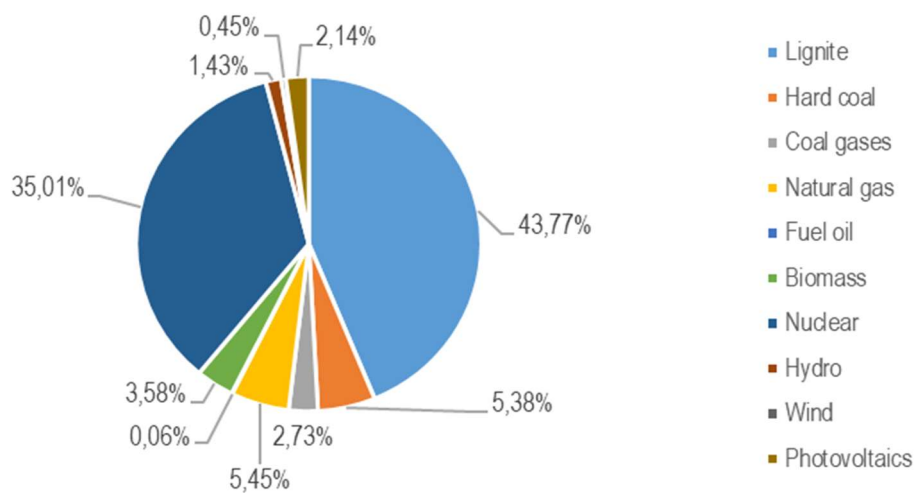


Figure 1 Czech residual electricity grid mix from Sphera

Modules declared, geographical scope, share of specific data (in GWP-GHG results) and data variation (in GWP-GHG results):

	Product stage			Construction process stage		Use stage							End of life stage				Resource recovery stage
	Raw material supply	Transport	Manufacturing	Transport	Construction installation	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction demolition	Transport	Waste processing	Disposal	Reuse-Recovery-Recycling-potential
Module	A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Modules declared	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Geography	GLO	GLO	CZ	GLO	GLO	GLO	GLO	GLO	GLO	GLO	GLO	GLO	GLO	GLO	GLO	GLO	GLO
Specific data used	>99%			-	-	-	-	-	-	-	-	-	-	-	-	-	-
Variation – products	NR			-	-	-	-	-	-	-	-	-	-	-	-	-	-
Variation – sites	NR			-	-	-	-	-	-	-	-	-	-	-	-	-	-

Content information

Product components	Weight, kg	Post-consumer material, weight-%	Biogenic material, weight-% and kg C/kg
Polycarbonate granulate	0,9982	0	0
Addition-curing two-component PUR foam	0,0100	0	0
Polyamide 6 fiber	0,0816	0	0
Steel, cold rolled	0,4160	14,80	0
Coating powder	0,0210	0	0
LDPE granulate	0,0016	0	0
Stainless steel	0,0256	15,60	0
Polyamide 6 granulate	0,0208	0	0
Copper Wire	0,1387	0	0
HDPE	0,0007	0	0
Steel, Zn	0,0093	17,40	0
LED driver	0,1530	0	0
LED modul	0,0934	0	0
TOTAL	1,9699	6,72	0
Packaging materials	Weight, kg	Weight-% (versus the product)	Weight biogenic carbon, kg C/kg
Paper	0,2957	15,01	0,38
LDPE	0,0022	0,11	0
TOTAL	0,2979	15,12	0,38

Dangerous substances from the candidate list of SVHC for Authorisation	EC No.	CAS No.	Weight-% per 1000 lumens of NANOTTICA 1.5ft ES PC 8000/840
No substances from the SVHC list to report.			

Results of the environmental performance indicators

Mandatory impact category indicators according to EN 15804

Results per 1000 lumens of NANOTTICA 1.5ft ES PC 8000/840										
Indicator	Unit	A1-A3	A4	A5	B6	C1	C2	C3	C4	D
GWP-fossil	kg CO2 eq.	4,86E+00	1,80E-01	6,33E-03	1,99E+02	3,81E-03	5,11E-03	1,19E+00	9,91E-05	-5,71E-01
GWP-biogenic	kg CO2 eq.	-1,37E-01	-2,52E-03	3,42E-02	1,17E-01	2,25E-06	-7,14E-05	1,24E-01	-3,29E-06	-4,26E-04
GWP-luluc	kg CO2 eq.	1,14E-03	1,65E-03	4,69E-07	1,29E-02	2,47E-07	4,68E-05	1,20E-05	3,08E-07	-6,60E-05
GWP-total	kg CO2 eq.	4,73E+00	1,79E-01	4,05E-02	1,99E+02	3,81E-03	5,09E-03	1,19E+00	9,61E-05	-5,72E-01
ODP	kg CFC 11 eq.	2,63E-08	1,56E-14	4,22E-14	1,97E-09	3,76E-14	4,42E-16	1,72E-13	2,55E-16	-2,17E-12
AP	mol H+ eq.	1,94E-02	2,06E-04	1,55E-05	2,92E-01	5,59E-06	6,84E-06	1,56E-04	7,02E-07	-7,42E-04
EP-freshwater	kg P eq.	3,52E-04	6,50E-07	3,14E-09	8,93E-05	1,71E-09	1,84E-08	4,51E-08	2,00E-10	-1,36E-07
EP-marine	kg N eq.	1,42E-03	6,75E-05	5,11E-06	7,99E-02	1,53E-06	2,46E-06	4,05E-05	1,81E-07	-2,03E-04
EP-terrestrial	mol N eq.	1,49E-02	8,29E-04	6,12E-05	8,54E-01	1,63E-05	2,93E-05	6,79E-04	2,00E-06	-2,21E-03
POCP	kg NMVOC eq.	5,56E-03	1,74E-04	1,38E-05	2,26E-01	4,32E-06	5,94E-06	1,15E-04	5,48E-07	-6,02E-04
ADP-minerals&metals*	kg Sb eq.	3,07E-04	1,15E-08	4,95E-10	2,37E-05	4,53E-10	3,26E-10	1,60E-09	4,58E-12	-5,57E-07
ADP-fossil*	MJ	7,55E+01	2,42E+00	9,25E-02	4,22E+03	8,07E-02	6,87E-02	4,11E-01	1,32E-03	-9,92E+00
WDP*	m3	4,65E-01	2,05E-03	4,79E-03	1,49E+01	2,84E-04	5,82E-05	1,08E-01	1,08E-05	-2,53E-02
Acronyms	GWP-fossil = Global Warming Potential fossil fuels; GWP-biogenic = Global Warming Potential biogenic; GWP-luluc = Global Warming Potential land use and land use change; ODP = Depletion potential of the stratospheric ozone layer; AP = Acidification potential, Accumulated Exceedance; EP-freshwater = Eutrophication potential, fraction of nutrients reaching freshwater end compartment; EP-marine = Eutrophication potential, fraction of nutrients reaching marine end compartment; EP-terrestrial = Eutrophication potential, Accumulated Exceedance; POCP = Formation potential of tropospheric ozone; ADP-minerals&metals = Abiotic depletion potential for non-fossil resources; ADP-fossil = Abiotic depletion for fossil resources potential; WDP = Water (user) deprivation potential, deprivation-weighted water consumption									

* Disclaimer: The results of this environmental impact indicator shall be used with care as the uncertainties of these results are high or as there is limited experience with the indicator.

Additional mandatory and voluntary impact category indicators

Results per 1000 lumens of NANOTTICA 1.5ft ES PC 8000/840										
Indicator	Unit	A1-A3	A4	A5	B6	C1	C2	C3	C4	D
GWP-GHG ¹	kg CO2 eq.	4,86E+00	1,82E-01	6,33E-03	1,99E+02	3,81E-03	5,16E-03	1,19E+00	9,94E-05	-5,71E-01

¹ This indicator accounts for all greenhouse gases except biogenic carbon dioxide uptake and emissions and biogenic carbon stored in the product. As such, the indicator is identical to GWP-total except that the CF for biogenic CO₂ is set to zero.

Particulate matter	Disease incidences	8,87E-08	1,40E-09	1,05E-10	2,61E-06	5,00E-11	5,64E-11	1,43E-09	8,64E-12	-8,07E-09
Ionising radiation, human health	kBq U235 eq.	1,73E-01	4,53E-04	2,06E-03	1,03E+02	1,96E-03	1,28E-05	2,93E-03	1,68E-06	-1,19E-01
Ecotoxicity fresh water	CTUe	3,10E+02	1,69E+00	3,04E-02	1,29E+03	2,47E-02	4,79E-02	2,27E-01	7,26E-04	-1,80E+00
Human toxicity, cancer	CTUh	4,68E-07	3,44E-11	7,70E-13	2,38E-08	4,55E-13	9,75E-13	1,56E-11	1,11E-13	-1,76E-10
Human toxicity, non-cancer	CTUh	5,87E-05	1,82E-09	3,73E-11	1,21E-06	2,32E-11	5,16E-11	1,90E-09	1,22E-11	-3,27E-09
Land Use	Pt	2,23E+01	1,01E+00	1,08E-02	3,87E+02	7,41E-03	2,87E-02	9,65E-02	3,32E-04	-4,50E-01

Resource use indicators

Results per 1000 lumens of NANOTTICA 1.5ft ES PC 8000/840										
Indicator	Unit	A1-A3	A4	A5	B6	C1	C2	C3	C4	D
PERE	MJ	1,53E+01	1,72E-01	1,45E-02	6,10E+02	1,17E-02	4,86E-03	9,22E-02	2,16E-04	-6,99E-01
PERM	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PERT	MJ	1,07E+01	1,72E-01	1,45E-02	6,10E+02	1,17E-02	4,86E-03	9,22E-02	2,16E-04	-6,99E-01
PENRE	MJ	1,06E+02	2,43E+00	9,26E-02	4,22E+03	8,08E-02	6,88E-02	4,11E-01	1,32E-03	-9,92E+00
PENRM	MJ	3,58E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PENRT	MJ	7,82E+01	2,43E+00	9,26E-02	4,22E+03	8,08E-02	6,88E-02	4,11E-01	1,32E-03	-9,92E+00
SM	kg	3,88E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
RSF	MJ	2,22E-22	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
NRSF	MJ	2,61E-21	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
FW	m3	3,31E-02	1,89E-04	1,24E-04	9,24E-01	1,77E-05	5,36E-06	2,56E-03	3,32E-07	-1,34E-03
Acronyms	PERE = Use of renewable primary energy excluding renewable primary energy resources used as raw materials; PERM = Use of renewable primary energy resources used as raw materials; PERT = Total use of renewable primary energy resources; PENRE = Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials; PENRM = Use of non-renewable primary energy resources used as raw materials; PENRT = Total use of non-renewable primary energy re-sources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Use of net fresh water									

Waste indicators

Results per 1000 lumens of NANOTTICA 1.5ft ES PC 8000/840										
Indicator	Unit	A1-A3	A4	A5	B6	C1	C2	C3	C4	D
Hazardous waste disposed	kg	5,07E-06	8,99E-12	6,13E-12	3,02E-07	5,77E-12	2,55E-13	8,18E-12	2,84E-14	-1,13E-09
Non-hazardous waste disposed	kg	1,01E-01	3,50E-04	1,27E-03	8,97E-01	1,72E-05	9,92E-06	6,37E-02	6,60E-03	-4,50E-03
Radioactive waste disposed	kg	2,95E-03	3,14E-06	1,40E-05	7,01E-01	1,34E-05	8,90E-08	2,08E-05	1,48E-08	-8,11E-04

Output flow indicators

Results per 1000 lumens of NANOTTICA 1.5ft ES PC 8000/840										
Indicator	Unit	A1-A3	A4	A5	B6	C1	C2	C3	C4	D
Components for re-use	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Material for recycling	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,32E-01	0,00E+00	1,25E-01
Materials for energy recovery	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Exported energy, electricity	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	2,01E+00
Exported energy, thermal	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	3,94E+00

Additional environmental information

NANOTTICA 1.5ft ES PC 8000/840 is manufactured in three variations of luminous flux - 3250 lm, 4000 lm, 5500 lm, 8000 lm. Conversion factors have been calculated to enable the conversion of results per 1000 lumens to correspondent luminous fluxes.

Conversion factors for NANOTTICA 1.5ft ES PC 8000/840:

	A1-A3	A4	A5	B6	C1	C2	C3	C4	D
3250 lm	3,25	3,25	3,25	3,25	3,25	3,25	3,25	3,25	3,25
4000 lm	3,25	3,25	3,25	3,90	3,25	3,25	3,25	3,25	3,25
5500 lm	3,25	3,25	3,25	5,34	3,25	3,25	3,25	3,25	3,25
8000 lm	3,25	3,25	3,25	7,41	3,25	3,25	3,25	3,25	3,25

More information can be found on the website www.trevos.eu.

References

General Programme Instructions of the International EPD® System. Version 4.1.

Product Category Rules (PCR) document for Construction Products (PCR 2019:14 Version 1.2.5, 2022-11-01)

ISO 14020:2000 Environmental labels and declarations — General principles, 2000-09

ISO 14025: EN ISO 14025:2006-11: Environmental labels and declarations - Type III environmental declarations — Principles and procedures

ISO 14040:2006 Environmental management — Life cycle assessment — Principles and framework, 2006-07

ISO 14044:2006 Environmental management — Life cycle assessment — Requirements and guidelines, 2006-07

EN 15804+A2:2019/AC:2021 European Committee for Standardization: Sustainability of construction works – Environmental product declarations – Core rules for the product category of construction products, 2021

Ecoinvent: www.ecoinvent.org, ecoinvent database 3.8.

Sphera: software LCA for Experts. 2023, Sphera solutions, www.sphera.com